

FORM PTO-1390 (Modified)
(RE 11-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

MAT-8101US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.5)

09 / 806120

PRIORITY DATE CLAIMED

29.July.1999

INTERNATIONAL APPLICATION NO.
PCT/JP00/04968INTERNATIONAL FILING DATE
26.July.2000TITLE OF INVENTION
MAGNETIC RECORDING AND REPRODUCING APPARATUS

APPLICANT(S) FOR DO/EO/US

M. Kinoshita

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. is transmitted herewith (required only if not transmitted by the International Bureau)
 - b. has been transmitted by the International Bureau.
 - c. is not required, as the application was filed in the United States Receiving Office (RO/US)
6. A translation of the International Application into English (35 U.S.C. 371(c)(2))
7. A copy of the International Search Report (PCT/ISA/210).
8. Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. have been transmitted by the International Bureau.
 - c. have not been made; however, the time limit for making such amendments has NOT expired.
 - d. have not been made and will not be made.
9. A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. A **FIRST** preliminary amendment.
16. A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. A substitute specification.
18. A change of power of attorney and/or address letter.
19. Certificate of Mailing by Express Mail
20. Other items or information:

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.5)

09/806120

INTERNATIONAL APPLICATION NO.

PCT/JP00/04968

ATTORNEY'S DOCKET NUMBER

MAT-8101US

21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	\$970.00
<input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	\$840.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	\$690.00
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4).....	\$670.00
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).....	\$96.00

CALCULATIONS PTO USE ONLY**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than 20 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	2 - 20 =	0	x \$18.00	\$0.00
Independent claims	1 - 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/>	\$0.00

TOTAL OF ABOVE CALCULATIONS =

\$860.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).	<input type="checkbox"/>	\$0.00
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SUBTOTAL =

\$860.00

Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).	<input type="checkbox"/>	\$0.00
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TOTAL NATIONAL FEE =

\$860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).	<input type="checkbox"/>	\$0.00
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TOTAL FEES ENCLOSED =

\$860.00

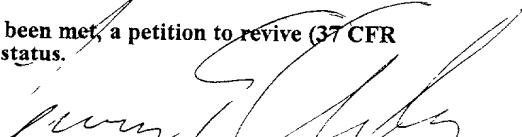
	Amount to be:	\$
	refunded	
	charged	\$

 A check in the amount of \$860.00 to cover the above fees is enclosed. Please charge my Deposit Account No. in the amount of to cover the above fees. A duplicate copy of this sheet is enclosed. The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 18-0350 A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Lawrence E. Ashery
 Ratner & Prestia
 P.O. Box 980
 Valley Forge, PA 19482
 (610) 407-0700



SIGNATURE

Lawrence E. Ashery

NAME

34,515

REGISTRATION NUMBER

March 29, 2001

DATE

09/806120

J008 Rec'd PCT/PTO 29 MAR 2001
PATENT

MAT-8101US

-1-

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: M. Kinoshita : Art Unit:
Serial No.: To Be Assigned : Examiner:
Filed: Herewith :
FOR: MAGNETIC RECORDING AND :
REPRODUCING APPARATUS :
:

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

SIR:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

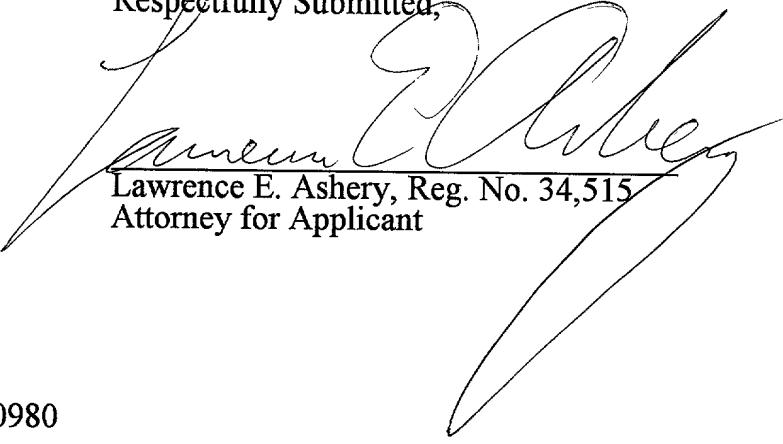
After the title and before the first paragraph, please insert --THIS APPLICATION IS A U.S. NATIONAL PHASE APPLICATION OF PCT INTERNATIONAL APPLICATION PCT/JP00/04968--.

IN THE DRAWINGS:

Please delete the last sheet of figures, also labeled as "List of Reference Marks".

SEARCHED INDEXED
MAILED

Respectfully Submitted,


Lawrence E. Ashery, Reg. No. 34,515
Attorney for Applicant

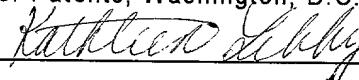
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The Assistant Commissioner for Patents
is hereby authorized to charge payment
to Deposit Account No. 18-0350 of any
fees associated with this
communication.

EXPRESS MAIL Mailing Label Number:EL741592620US

Date of Deposit: March 29, 2001

I hereby certify that this paper and fee are being deposited, under 37 C.F.R. § 1.10 and
with sufficient postage, using the "Express Mail Post Office to Addressee" service of the
United States Postal Service on the date indicated above and that the deposit is
addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.



Kathleen Libby

SPECIFICATION:

At page 1, line 4:

THIS APPLICATION IS A U.S. NATIONAL PHASE
APPLICATION OF PCT INTERNATIONAL APPLICATION
PCT/JP00/04968.

MAT-8101US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: M. Kinoshita : Art Unit:
Serial No.: 09/806,120 : Examiner:
Filed: Herewith :
FOR: MAGNETIC RECORDING AND :
REPRODUCING APPARATUS :

SUPPLEMENTAL PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

SIR:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS:

Please cancel claims 1 and 2 and add newly added claims 3, 4 and 5.

3. (Newly Added) An audio and video recording and reproduction device for processing audio and video data segments, comprising:

means for shuffling the segments of audio and video data;

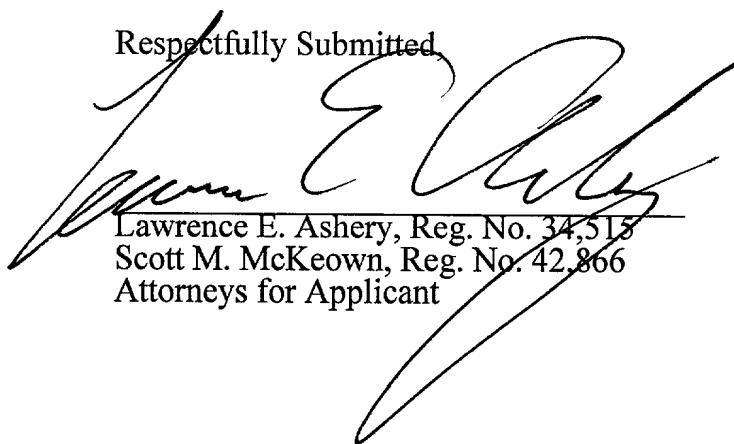
means for storing the shuffled segments according to their shuffled sequence;

means for addressing locations where the shuffled segments are located to output the shuffled segments in a de-shuffled sequence.

4. (Newly Added) The recording and reproducing apparatus of claim 3, wherein said means for de-shuffling rearranges reproduced audio data according to a reproduction direction of said apparatus.

5. (Newly Added) The audio and video recording apparatus of claim 3, wherein the means for addressing the locations outputs a sequence reverse to said de-shuffled sequence.

Respectfully Submitted


Lawrence E. Ashery, Reg. No. 34,515
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Attorneys for Applicant

LEA/ap

Dated: May 11, 2001
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The Assistant Commissioner for
Patents is hereby authorized to
charge payment to Deposit Account
No. 18-0350 of any fees associated
with this communication.

I hereby certify that this correspondence is being
deposited with the United States Postal Service
as first class mail, with sufficient postage, in an
envelope addressed to: Assistant Commissioner
for Patents, Washington, D.C. 20231 on:

May 11, 2001

Yusaili Mochad

VERSION WITH MARKINGS TO SHOW CHANGES MADE

CLAIMS:

Claims 1 and 2 have been cancelled.

Claims 3-5 are newly added.

P23217

DESCRIPTION**Magnetic Recording and Reproducing Apparatus****5 Technical Field**

The present invention relates to a magnetic recording and reproducing apparatus which encodes audio and video (hereinafter referred to as A & V) data into digital form and records or reproduces the digital form.

10 Background Art

A digital recording and reproducing apparatus of A & V encodes an audio signal and a video signal into digital data, then rearranges a time-sequence of the data every certain amount of data, then the rearranged data is recorded into magnetic recording medium. The rearranged data is restored
15 to original time sequence when the data is reproduced.

The rearrangement at recording and its restoring at reproducing are referred to as "shuffling" and "deshuffling." This method is effective when parts of the data are dropped out due to scratches on the magnetic medium, because the drop-outs are not intensively gathered at one point but they are
20 dispersed. As a result, a time of audio discontinuity due to drop-out of data can be shortened.

When data is reproduced in a reverse direction by such a conventional magnetic recording and reproducing apparatus as discussed above, audio data deshuffled is once stored in a memory, then the data is read out in a reverse order from the memory at given intervals. This is for realizing the same practice as a recording and reproducing apparatus having a linear audio track.

Fig. 3 is a block diagram of a deshuffling section of the conventional recording and reproducing apparatus.

The deshuffling section at the reproducing side shown in Fig. 3 comprises the following elements:

- 5 (a) video deshuffling circuit 4;
- (b) video deshuffling address generator 5 for instructing an order of video deshuffling;
- (c) audio deshuffling circuit 6;
- (d) audio deshuffling address generator 7 for instructing an order of
- 10 audio deshuffling;
- (e) data rearranging circuit 8 for reverse reproduction; and
- (f) switching circuit 9 for switching a signal responsive to data-reproduction-direction-signal 10.

Deshuffling circuit 4 and address generator 5 constitutes a video deshuffling
15 section.

An output data from deshuffling circuit 6 is stored in a built-in memory of data rearranging circuit 8. Circuit 6 reads the data at given intervals from the built-in memory in a reverse order to the storing order.

When the data is reproduced in a normal direction (reproduction in a
20 positive direction), switching circuit 9 is closed to contact 9a side, and output data is supplied from audio deshuffling circuit 6 as audio data. When the data is reproduced in a reverse direction, circuit 9 is closed to contact 9b side, and output data is supplied from data rearranging circuit 8 as audio data.

The conventional method discussed above requires the data
25 rearranging circuit having the built-in memory in order to rearrange the deshuffled audio data to reverse order when the data is reproduced in a reverse direction. As a result, this structure increases the cost. Further the

deshuffled audio data should be stored in a given period for rearrangement. On the other hand, deshuffled video data does not require the rearranging circuit. Therefore, the audio data is delayed with respect to the video data for a certain period due to the rearrangement. In general, this certain period often corresponds to one frame of video data. Thus reproduction timings of video data and audio data do not agree upon each other.

Summary of the Invention

The present invention addresses the problem discussed above, and aims to provide a digital recording and reproducing apparatus which does not need rearrangement of audio data after deshuffling at reverse reproduction and which can reproduce audio data at the same timing as video data.

A magnetic recording and reproducing apparatus, which rearranges digital data of A & V according to a given rule, has deshuffling means which performs the following jobs in order to solve the problem. (a) Rearranging reproduction-data in a normal direction to an order before the shuffling, then outputting the data; and (b) rearranging reproduction-data in a reverse direction to an order reverse to the order before the shuffling, then outputting the data.

20

Brief Description of Drawings

Fig. 1 is a block diagram showing a deshuffling section of a digital magnetic recording and reproducing apparatus in accordance with a first exemplary embodiment of the present invention.

25 Fig. 2 schematically describes the deshuffling of the apparatus in accordance with the first exemplary embodiment of the present invention.

Fig. 3 is a block diagram showing a deshuffling section of a

conventional magnetic recording and reproducing apparatus.

Detailed Description of Preferred Embodiment

(Exemplary Embodiment 1)

5 Fig. 1 is a block diagram showing a deshuffling section of a digital magnetic recording and reproducing apparatus in accordance with a first exemplary embodiment of the present invention. In Fig. 1, video deshuffling section 1 is the same as a conventional one. Fig. 2 schematically describes the deshuffling of the apparatus in accordance with the first exemplary 10 embodiment of the present invention.

In this embodiment, audio data in one frame of a video signal is divided into nine data blocks such as D1, D2,, D9, and this unit block undergoes shuffling or deshuffling.

The embodiment is described hereinafter with reference to Fig. 1 and 15 Fig. 2.

An audio data block row (D1, D2, D3, D4, D5, D6, D7, D8, D9) is shuffled to block row 20 of which order is (D7, D2, D6, D4, D1, D5, D8, D9, D3), and recorded in a magnetic recording and reproducing apparatus.

When the data is reproduced, block row 20 is reproduced according to 20 an order of its data blocks having been recorded, then the data is fed to deshuffling circuit 2, which stores each block of row 20—following the input order—into addresses a1, a2, a3, b1, b2, b3, c1, c2, c3 of built-in memory 29.

Address generator 3 for audio deshuffling follows input reproduction-direction-signal 10, and outputs a read-out address of memory 29. In other 25 words, when signal 10 indicates a reproduction in a normal direction, address generator 3 outputs read-out address 31 of which order is b2, a2, c3, b1, b3, a3, a1, c1, c2. When signal 10 indicates a reproduction in a reverse direction,

address generator 3 outputs read-out address 32 of which order is c2, c1, a1, a3, b3, b1, c3, a2, b2.

Deshuffling circuit 2 reads data blocks stored in memory 29 following read-out addresses supplied. In other words, when read-out address 31 is input, data blocks are read out in the order of b2, a2, c3, b1, b3, a3, a1, c1, c2. As a result, audio data 21 is output in the order of D1, D2, D3, D4, D5, D6, D7, D8, D9. When read-out address 32 is input, deshuffling circuit 2 reads out addresses in the order of c2, c1, a1, a3, b3, b1, c3, a2, b2. Then audio data 22 is output in the order of D9, D8, D7, D6, D5, D4, D3, D2, D1.

As such, the present invention proves that an audio data rearranging circuit subsequent to deshuffling is not needed, and a timing shift between video data and audio data can be eliminated.

Industrial Applicability

A magnetic recording and reproducing apparatus of the present invention reverses an order of data rearrangement in a deshuffling circuit at a reproduction in a reverse direction to an order of a reproduction in a normal direction. Thus an audio-data-rearranging-circuit is not needed, and at the same time, A & V data can be reproduced free from timing shift therebetween. .

CLAIMS

1. A magnetic recording and reproducing apparatus performs shuffling of digital audio and video data according to a given rule, then
5 records the data, said apparatus including:

deshuffling means for rearranging reproduction data in a normal direction to an order before the shuffling, and outputting the data, or for rearranging reproduction data in a reverse direction to a reverse order before the shuffling, and outputting the data.

10

2. The magnetic recording and reproducing apparatus as defined in Claim 1, wherein said deshuffling means rearranges reproduced audio data according to a reproduction direction of said apparatus.

[REDACTED]

ABSTRACT

In a magnetic recording and reproducing apparatus which digitally records and reproduces audio and video data, at a reproduction in a reverse direction, address generator 3 for audio deshuffling outputs addresses for 5 deshuffling in a reverse order to an order of a reproduction in a normal direction. Audio deshuffling circuit 2 outputs audio data following the addresses supplied from address generator 3.

U.S. GOVERNMENT PRINTING OFFICE: 1973 50-573-104

FIG. 1

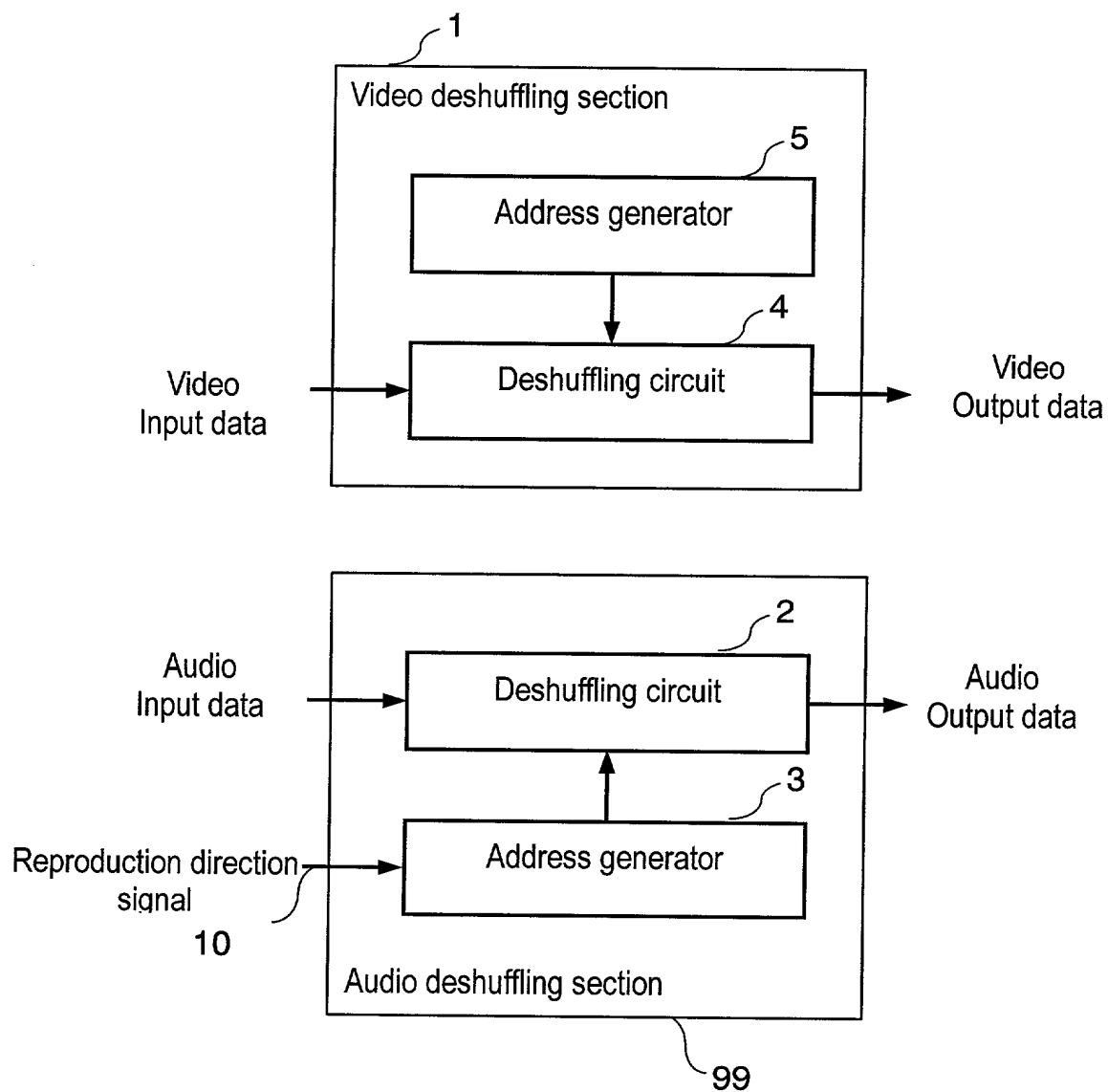


FIG. 2

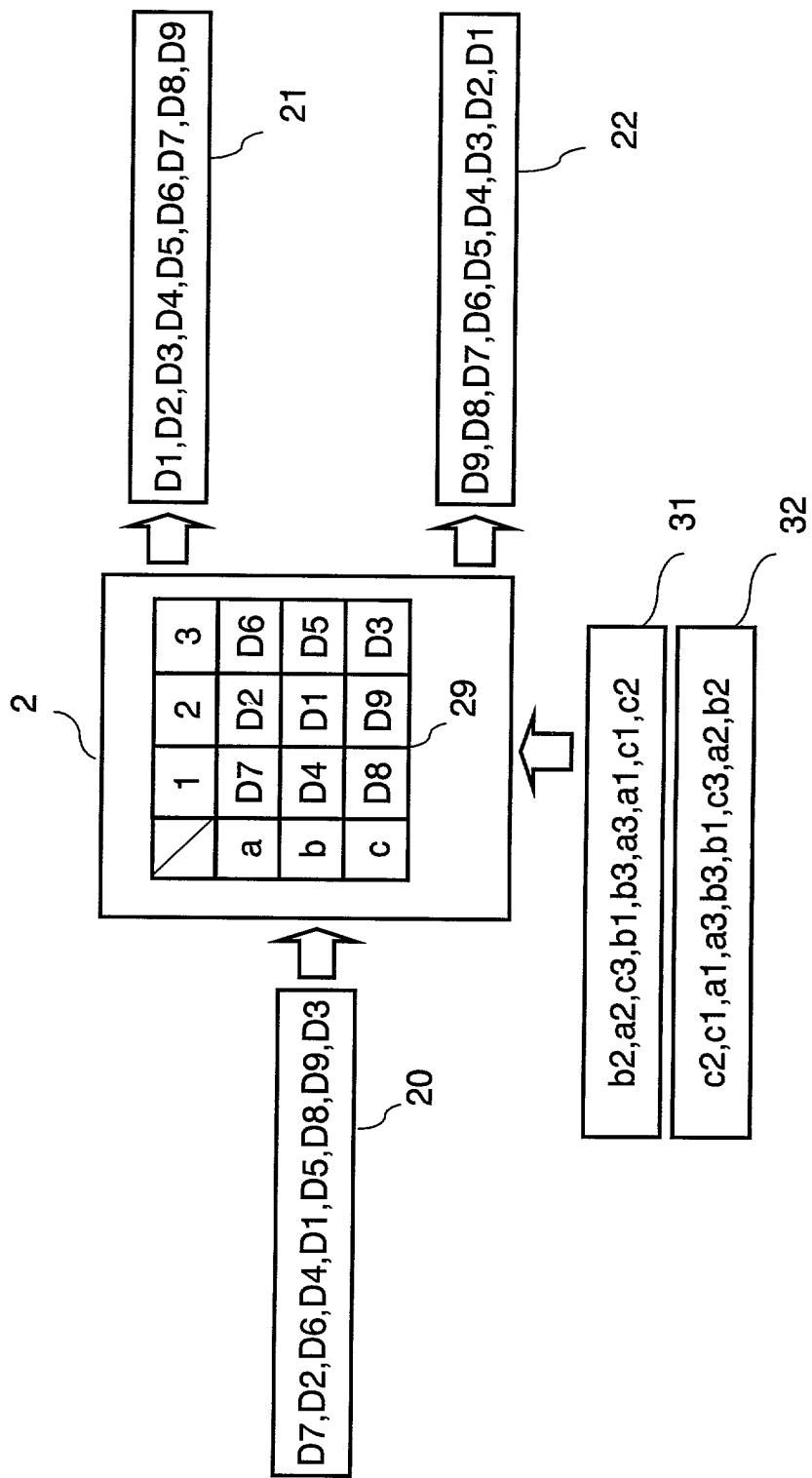
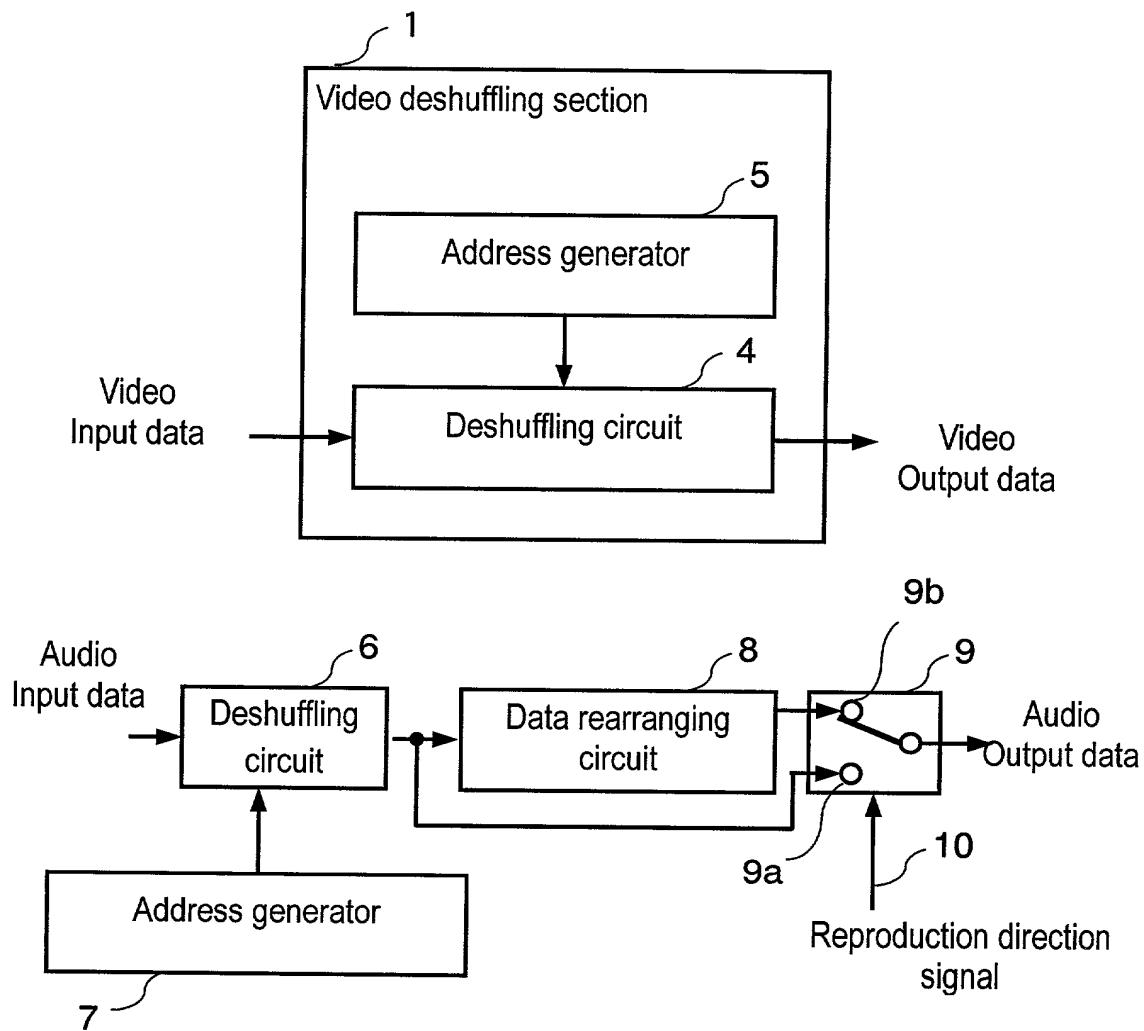


FIG. 3



List of Reference Marks

1. video deshuffling section
2. audio deshuffling section
3. audio deshuffling address generator
4. video deshuffling circuit
5. video deshuffling address generator
6. audio deshuffling circuit
7. audio deshuffling address generator
8. data rearranging circuit
9. switching circuit
10. data reproduction direction signal
11. audio deshuffling section

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MAGNETIC RECORDING AND REPRODUCING APPARATUS,

the specification of which is attached hereto unless the following box is checked:

was filed on July 26, 2000 as

United States Application Number or PCT International Application Number PCT/JP00/04968
and was amended on March 29, 2001 (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Not Claimed

11-214697	Japan	29/July/1999	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

_____	_____
(Application Number)	(Filing Date)

_____	_____
(Application Number)	(Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Number) _____ (Filing Date) _____ (Status - patented, pending, abandoned)

(Application Number) _____ (Filing Date) _____ (Status - patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Paul F. Prestia	Reg. No. <u>23,031</u>	Lawrence E. Ashery	Reg. No. <u>34,515</u>	Jack J. Jankovitz	Reg. No. <u>42,690</u>
Allan Ratner	Reg. No. <u>19,717</u>	Christopher R. Lewis	Reg. No. <u>36,201</u>	Jonathan H. Spadt	Reg. No. <u>45,122</u>
Andrew L. Ney	Reg. No. <u>20,300</u>	Robert L. Andersen	Reg. No. <u>25,771</u>	Christopher I. Halliday	Reg. No. <u>42,621</u>
Kenneth N. Nigon	Reg. No. <u>31,549</u>	Joshua L. Cohen	Reg. No. <u>38,040</u>	Scott A. McKeown	Reg. No. <u>42,866</u>
Kevin R. Casey	Reg. No. <u>32,117</u>	Daniel N. Calder	Reg. No. <u>27,424</u>		
Benjamin E. Leace	Reg. No. <u>33,412</u>	Louis W. Beardell, Jr.	Reg. No. <u>40,506</u>		
James C. Simmons	Reg. No. <u>24,842</u>	Jacques L. Etkowicz	Reg. No. <u>41,738</u>		

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Ratner & Prestia, Suite 301, One Westlakes, Berwyn, P.O. Box 980, Valley Forge, PA 19482-0980

Address all telephone calls to: Lawrence E. Ashery at (610) 407-0700.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Minoru Kinoshita

Inventor's signature Minoru Kinoshita Date June 14, 2001

Residence Osaka, Japan

Citizenship Japanese

Post Office Address 4-63-19-303, Kisabe, Katano-shi

Osaka 576-0052 Japan

Full name of second joint inventor, if any (given name, family name) _____

Second Inventor's signature _____ Date _____

Residence _____

Citizenship _____

Post Office Address _____

Additional inventors are being named on separately numbered sheets attached hereto.